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# National Systematics Laboratory Report for Calendar Year 1992

Washington, D.C.

May 1993

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**U.S. DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
National Marine Fisheries Service

# ANNUAL REPORT
# National Systematics Laboratory
# Calendar Year 1992

Washington, D.C.
May 1993

**U.S. DEPARTMENT OF COMMERCE**
**Ronald H. Brown, Secretary**

**National Oceanic and Atmospheric Administration**
**Diana H. Josephson, Acting Under Secretary of Commerce for Oceans and Atmosphere**

National Marine Fisheries Service
Nancy Foster, Acting Assistant Administrator for Fisheries

# 1992 HIGHLIGHTS

- Systematics Laboratory celebrated 50th anniversary and completed 50 year bibliography of publications from the Laboratory
- Dr. Austin Williams awarded Department of Commerce bronze medal in recognition of his outstanding contributions to knowledge of decapod crustaceans
- Dr. Thomas Munroe won *Fishery Bulletin* best publication award for 1991
- Ms. Martha Nizinski, Dr. Bruce Collette, and Ms. Betsy Washington received honorable mention for best publication award in 1990 *Fishery Bulletin*
- NSL staff participated in several biodiversity workshops
- Paper published resolving systematics and osteology of the double-lined mackerel genus *Grammatorcynus*
- Manual on identification of larval and juvenile squids published
- Paper distinguishing juvenile stages of rock crabs (*Cancer*) published
- Type catalog of beloniform fishes published
- Paper describing patterns of interdigitation of dorsal-fin pterygiophores and dorsal spines in symphurine tonguefishes published
- Paper completed describing new species of cutlassfish from the western Atlantic
- Paper completed describing new species of halfbeak from Atlantic and Gulf coasts of the United States

## MISSION

The National Systematics Laboratory is the primary element of NOAA involved in defining and characterizing marine biodiversity. We conduct taxonomic research on marine organisms of economic and ecological value to the United States. In addition to providing taxonomic information on species that are commercially important, scientific studies conducted by Systematics Laboratory personnel comprise significant contributions to the study of marine biodiversity by describing and naming new species as well as revising existing names and descriptions based on new information. Because many important species are widespread or migratory, our research is worldwide.

Accurate taxonomic information is the critical first step in recognizing individual species. This information provides an understanding of the diversity of marine communities and is the necessary basis for proper management of our nation's living marine resources. Without a clear understanding of what individual species look like, where they are found, and what their names are, we cannot collect accurate statistics, develop reasonable national fishing and conservation regulations, set catch limits, or begin to understand the complexity and diversity of marine communities.

The Systematics Laboratory is actively involved in studying the taxonomy and biodiversity of fishes, crustaceans, and squids. We have a permanent staff of four systematists, a systematist emeritus, three museum technicians, a scientific illustrator, and a secretary. The systematists include Drs. Bruce B. Collette and Thomas Munroe as ichthyologists, Dr. Michael Vecchione as a malacologist specializing in squids, and Drs. Austin Williams and Isabel Pérez Farfante as decapod crustacean specialists. In addition, we currently have two visiting investigators, one from India, Dr. A. Rajaguru, and one from the NOAA National Undersea Research Program, Dr. David Stein. Last summer we had a summer aide and two student interns, Amy Downing and Phil Schaner.

A unit of the Northeast Fisheries Science Center, National Marine Fisheries Service, we are located in the National Museum of Natural History, where we can take advantage of one of the world's leading systems of collections, libraries, equipment, and facilities that are designed specifically for taxonomic and systematic research. The opportunity to meet and communicate with other taxonomic experts who reside in or visit the Smithsonian keeps us current on the latest ideas and techniques in the field. As Smithsonian Research Associates, we expand Smithsonian scientific capabilities and help build and curate Smithsonian collections.

The Systematics Laboratory has two major responsibilities, research and service. Our research produces two principal products: 1) worldwide and regional taxonomic monographs, which are scholarly documents that identify, describe, and catalogue the diversity of species within selected taxa of marine organisms of commercial or ecological importance; and 2) various aids to identification. These documents provide the necessary information for non-specialists to recognize and identify marine organisms.

The Systematics Laboratory serves many public as well as private institutions and individuals worldwide by providing expert identifications and information for a diversity of marine organisms including, but not limited to, the groups we study. We also review and comment upon manuscripts for scientific journals and for colleagues in the National Marine Fisheries Service, other agencies, and academia. Our staff evaluates research proposals for the National Science Foundation, Sea Grant, and similar research funding agencies.

In addition to these activities, staff members serve as officers of various scientific associations and participate in university affairs as research associates and adjunct professors.

## HISTORY

The origin of the National Systematics Laboratory can be traced back to 15 August 1942, when Samuel F. Hildebrand moved into the Division of Fishes of the National Museum of Natural History to continue his ichthyological research for the Department of the Interior's Bureau of Fisheries; this followed the merger of the Bureau of Fisheries fish collection with that of the U. S. National Museum. The Laboratory, then the National Center for Systematics, was transferred from the Department of the Interior to the

National Oceanic and Atmospheric Administration in 1970 and renamed the National Systematics Laboratory. The Laboratory is administered by the Northeast Fisheries Science Center, National Marine Fisheries Service, but also is responsible to the National Marine Fisheries Service Research Council and other regional Fisheries Science Centers.

## RESEARCH

Twenty-one papers by NSL scientists were published in calendar year 1992 (listed at end of this report). Research completed in 1992 and earlier has led to 11 more papers that are now in press. Eight additional manuscripts were completed. Major accomplishments in 1992 are listed below for each investigation.

## FISHES

Pelagic fishes of great importance to man live in the highly productive surface layers of the ocean where species tend to grow large and range widely. Emphasis is devoted to studying the anatomy and systematics of scombroids, the group that includes the tunas, Spanish mackerels, bonitos, and mackerels. Although many of the species have been known for a long time and an extensive literature treats them, detailed anatomical descriptions and comparisons are few, incorrect scientific names are often used, geographical ranges for many are not delimited precisely, and poorly documented classifications are current. The giant tunas, bonitos, Spanish mackerels, and double-lined mackerels found around the world have been treated by Dr. Collette and colleagues in a series of monographs and papers.

Several other groups of fishes are also under study. These include halfbeaks (Hemiramphidae) and needlefishes (Belonidae), abundant fishes, which are important forage species and are of local importance as food and bait. Monographs on these two families are being prepared by Dr. Collette for the series, *Fishes of the Western North Atlantic*.

*1. Revision of Fishes of the Gulf of Maine.*- A revision of Henry B. Bigelow and William C. Schroeder's classic 1953 volume *Fishes of the Gulf of Maine* is underway by Drs. Bruce B. Collette and Grace Klein-MacPhee. A contract was signed for publication of the revised volume by the Smithsonian Institution Press. Drafts of revised accounts for sections on eels were produced by Dr. David Smith (Smithsonian), snailfishes by Dr. Kenneth Able (Rutgers University), anchovies by Dr. Thomas Munroe, and part of the sticklebacks by Dr. William Krueger (University of Rhode Island). Accounts for 138 of the approximately 236 species (58%) have now been drafted.

*2. Tunas and mackerels.*- A paper describing osteological differences between the two species of double-lined mackerels, *Grammatorcynus*, redefining the genus and species and summarizing the literature on these two species was published in 1992. This paper was begun with Mr. Gary Gillis, a Smithsonian Vertebrate Zoology summer intern in 1989. Another paper, describing a new species of cutlassfish (*Lepidopus*) from the western Atlantic, was completed with a Russian colleague. Progress was made on revising the frigate tunas, *Auxis*.

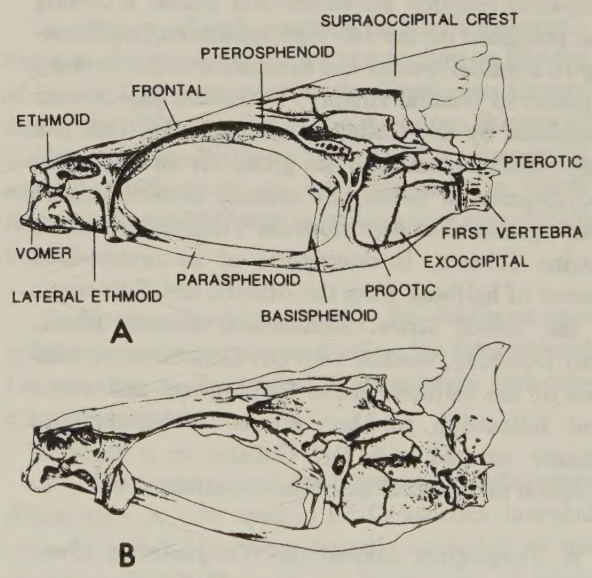


Figure 1. Lateral view of skulls in *Grammatorcynus*. The orbit of *G. bilineatus* is larger than that of *G. bicarinatus*. Orbit length in *G. bilineatus* is 51-54% of neurocranium length vs. 47-49% in *G. bicarinatus*. A. *G. bilineatus*, Scott Reef, Timor Sea, 453 mm FL. B. *G. bicarinatus*, Western Australia, Exmouth Gulf, 765 mm FL.

*3. FAO.*- The Systematics Laboratory continues to support the efforts of international organizations to make the results of systematic research available to a wider audience. Drs. Collette and N.V. Parin (Russian Academy of Sciences) have agreed to produce a world catalogue of beloniform fishes, the flyingfishes, sauries, needlefishes, and halfbeaks, for FAO. Dr. Munroe is preparing FAO Species Identification Sheets for cynoglossid flatfishes occurring in the eastern Pacific and has begun work on a world catalogue of flatfishes.

*4. Fishes of Walters Shoals.*- Walters Shoals is a shallow-water seamount 400 nautical miles south of Madagascar and 600 nm east of South Africa. Dr. Collette participated in a cruise of the Russian oceanographic vessel Vityaz, which collected over Walters Shoals in December 1988. During 1992, a third new species was described from Walters Shoals by Dr. Collette and colleagues, *Paracaesio waltervadi*, a species of mid-water snapper.

*5. Halfbeaks and needlefishes.*- As part of the long-term research on beloniform fishes, a catalog was published on the 544 type specimens, representing 76 nominal species and subspecies in the National Museum of Natural History. Two other papers were completed by Dr. Collette and colleagues. One is a semi-popular account of the group for an Australian encyclopedia of fishes, the second, in collaboration with a graduate student from the Virginia Institute of Marine Science, is description of an undescribed species of halfbeak from the Atlantic and Gulf coasts of the United States. Smithsonian summer intern, Amy Downing, worked with Dr. Collette on systematics of the halfbeak genus *Dermogenys* and won a Pew fellowship for her efforts. Volunteer Phil Schaner worked with Dr. Collette on a study of variation in vertebral numbers in halfbeaks.

*6. Tonguefish taxonomy.*- Tonguefishes (*Symphurus*) are small to medium-sized flatfishes comprising significant portions of the demersal fish faunas inhabiting sandy and muddy substrates in coastal seas of the New World and are under study by Dr. Munroe. Approximately 30 species of tonguefishes, some of which are important in the by-catch recorded in commercial fishing activities, are currently recognized in the eastern Pacific and western Atlantic. In 1992, a paper describing the pattern of interdigitation of dorsal-fin pterygiophores and neural spines occurring in 69 of 71 species presently recognized in the genus was published. This paper represents the first detailed discussion and evaluation of this character, based on examination of radiographs for over 4200 specimens, as a diagnostic character in distinguishing individual species or species groups within *Symphurus*. A paper on the systematics of western Atlantic species of the *Symphurus plagusia* complex won the best publication award for a paper by a NMFS employee appearing in the *Fishery Bulletin* for volume 89. This paper revealed that the previously held concept, of only one widespread species, was incorrect and that actually four species, two of which were previously undescribed, are included in this complex. This information was used by fishery scientists from the NMFS Pascagoula Laboratory to prepare mathematical models estimating catch rates of tonguefishes and other small flounders in demersal trawl fishing activities. In 1992, preparation of identification sheets for tonguefishes of the genus *Symphurus* occurring in the eastern Pacific was begun in collaboration with an FAO sponsored project.

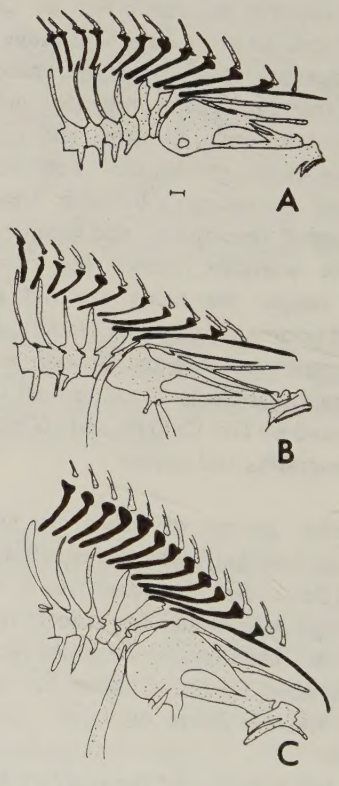


Figure 2. Interdigitation of proximal dorsal pterygiophores and neural spines in three species of *Symphurus*. A. *S.nebulosus*. B. *S. marginatus*. C. *S. plagiusa*.

*7. Type specimens of clupeoid fishes.*- A catalog of type specimens of clupeoid fishes in the collection of the United States National Museum is in preparation by Dr. Munroe.

*8. Antarctic Liparididae.*- Dr. David Stein, Biology Program Director, National Undersea Research Program, has taken up part-time residence at NSL to continue his taxonomic studies on Antarctic Liparididae, with funding from the National Science Foundation which has been transferred to NSL.

## CRUSTACEANS

The groups of crustaceans most directly important to fisheries are the shrimps (mainly penaeoid species), lobsters, and crabs. Research on shrimps in the National Systematics Laboratory is conducted by Dr. Isabel C. Canet (Pérez Farfante), and that on crabs, lobsters, and other decapods by Dr. Austin B. Williams.

The shrimp fishery is the most valuable single segment of the U.S. fishing industry. In 1991, domestic commercial landings amounted to 320,087,000 lbs (heads-on-weight) with an ex-vessel value of $512,848,000, and an additional 632,775,000 lbs (heads-off), with a value of $1,856,667,000, were imported. To satisfy this great demand, more species have been added to the list of commercially valuable shrimps during the last few years, and new beds have been exploited both in nearby and distant regions, in both shallow and deep waters. Wise management efforts and meaningful ecological and physiological studies require thorough knowledge of the systematics of these crustaceans.

Crabs and lobsters are among the most conspicuous animals in catches from heavily fished marine waters of the world. In U.S. domestic landings, they yield in combination about half of the tonnage of domestic crustacean fishery production and nearly half of its dollar value. In their adult phase they are prominent members of bottom communities, ranging from marshlands and estuaries through nearshore systems to the deep sea, and occupy dominant positions in the biological communities where they live. A huge literature exists for some species that are seemingly well known, but because of faulty oversimplified descriptions and distribution ranges, community relationships of many such species may be poorly understood. Still other species have been uncritically identified, and many have never been recognized and described.

*1. Dr. Austin B. Williams receives a Department of Commerce Bronze Medal.*- On September 22, Dr. Williams was awarded a Department of Commerce Bronze Medal for his outstanding contributions to the knowledge of decapod crustaceans. Dr. Williams has been with the National Marine Fisheries Service Systematics Laboratory for the last 21 years; he has also been a resident Research Associate of the Department of Invertebrate Zoology at the Smithsonian's Museum of Natural History during that time. A specialist in blue crabs and the decapod crustaceans of hydrothermal vents, Dr. Williams is probably best known for his book *Shrimps, Lobsters, and Crabs of the Atlantic Coast of the Eastern United States, Maine to Florida* published by SI Press in 1984. He has served as an officer in many scientific societies including the presidencies of the Biological Society of Washington and of the American Association for Zoological Nomenclature based at NMNH.

*2. History of crab research in North America.*- From an oral presentation in a symposium on History of Carcinology sponsored by the Crustacean Society during the 1990 meeting of the American Society of Zoologists, Dr. Williams developed a manuscript entitled "Reflections on crab research in North America since 1758" that is in press in a symposium volume.

*3. Nomenclatural problems.*- Dr. Williams provided comments on two cases before the International Commission on Zoological Nomenclature that concern crustaceans.

*4. New crabs named for Systematics Laboratory Scientists.*- A new species of Cretaceous homolid crab from the *Linuparus* faunal association of the Turonian Carlile Shale in the Black Hills of South Dakota was named *Homolopsis williamsoni* by Dr. Gale A. Bishop in honor of Austin B. Williams in the *Proceedings of the Biological Society of Washington*. In the same issue of this journal, Raymond B. Manning named a geryonid crab from Walters Shoals, Madagascar Ridge, *Chaceon collettei* in honor of Bruce B. Collette, who collected the material of the new species on board the Russian research vessel Vityaz.

*5. Distinguishing juvenile stages of Cancer crabs.*- Juvenile stages of the Jonah crab, *Cancer borealis*, and the Atlantic rock crab, *C. irroratus* that occur together in the western North Atlantic, have heretofore been indistinguishable. Dr. Williams and Dr. R. Wahle, Brown University, collaborated in devising a method for distinguishing these juvenile stages that was published in 1992.

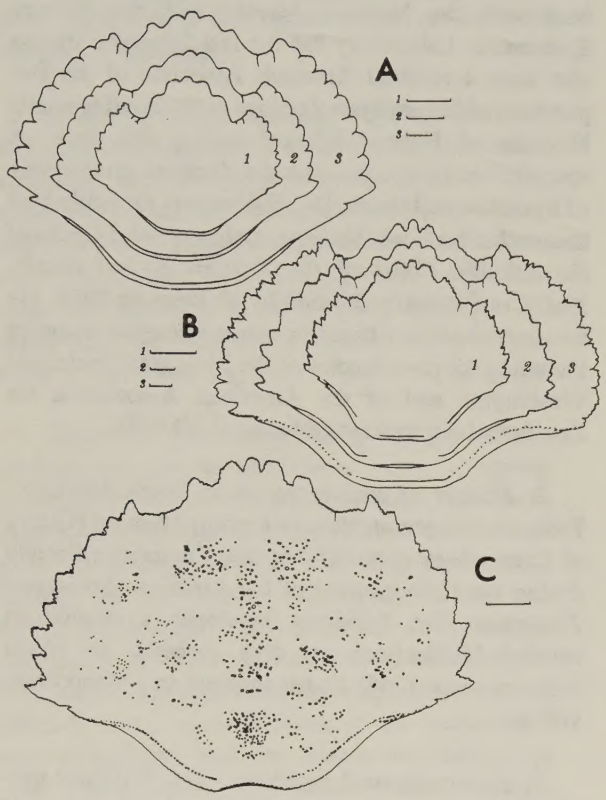


Figure 3. Nested semidiagrammatic carapace outlines of juvenile *Cancer*. A. *C. irroratus*. B. *C. borealis*. C. *C. borealis* showing distribution of granules. Scales = 1mm.

*6. Mud shrimps of the western Atlantic.*- A monograph on mud shrimps, Upogebiidae, of the western Atlantic has been completed. Study of specimens collected by recent oceanographic workers, and those deposited in research collections of museums of the western hemisphere and Europe, shows that 24 species occur in the region. Eleven of these are new to science, including one new genus. Descriptions, illustrations, keys to identification, distribution, and relationships of the fauna to that in other regions are discussed by Dr. Williams in a paper in press.

*7. Biology of the American lobster.*- Dr. Williams is writing a chapter on taxonomy and evolution of the American lobster for a multi-authored book that will be assembled in the coming year.

*8. Crabs from deep water trapping off Guam.*- Crabs captured in baited traps set in deep water near Guam by L.G. Eldrege and students, University of Guam, have yielded rare distributional records and species unknown to science. Dr. Williams compared material in the Guam collection with specimens in the Bishop Museum, Honolulu, and in the Queensland and Australian museums, Brisbane and Sydney. He and Dr. Eldredge will present results of study in a series of papers; the first now in progress is description of a new species of spider crab.

*9. Submarine-vent crustaceans.*- Hydrothermal vents, and cold brine and hydrocarbon seeps in the world oceans, have become major foci of oceanographic discovery and research in the past 15 years. With the aid of increasingly sophisticated exploratory techniques and equipment operated by NOAA and other agencies, these features have come to be recognized as widely associated with tectonically active zones of the ocean floor. The vents and seeps have been in existence since very early in the earth's history, and through geological and biological processes have had profound influence on the oceans. Through time, representatives of many organismic groups have adapted to unique systems of nutrition in these evironments at depths beyond the reach of light, and among the groups represented are decapod crustaceans. From the first discovery of these features, Dr. Williams has been describing decapods collected from them in a series of papers. New discoveries from brine and hydrocarbon seeps in the Gulf of Mexico are being sent to him for study.

*10. Revision of the families and genera of the penaeidean shrimps.*- Dr. Pérez Farfante and Dr. B. Kensley of the Department of Invertebrate Zoology in the Smithsonian's National Museum of Natural History are collaborating on a systematic revision and catalogue of penaeidean shrimps. For each of about 50 generic-groups to be covered in the catalogue, the following information is included: original reference, synonyms, type-species, gender, list of nominal species, and distribution. Additionally, phylogenetic relationships based on cladistic studies will be established for groups of genera and various higher

taxonomic categories. In the course of checking published generic diagnoses against actual animals, it was found that the existence of complex internal seminal receptacles in the female of some species had either been ignored or erroneously reported by earlier workers. In many cases, intricate saclike structures have been found in genera previously stated to have simple open thelyca. The evolution of such complex invaginations of the exoskeletons clearly has phylogenetic implications. These structures are now being investigated in all genera of the Penaeidae. In large genera suspected of being polyphyletic, several species have to be examined. This work involves dissection of the female thoracic sternites, clearing and staining to make the three-dimensionality of the structures visible, illustration where necessary, and has resulted in at least a 9-month delay in completion of the project.

*11. Hermaphroditism in cultured shrimps.*- A paper by Dr. Pérez Farfante and L. Robertson describing the occurrence of hermaphroditism in broodstock of commercially cultured penaeid shrimp (*Penaeus vannamei*) from Venezuela was published. Two individuals that exhibit both male and female external organs and ovaries and testes with corresponding apertures were found. These are the first known specimens to possess clearly defined male and female gonads and secondary sexual features. Hermaphroditism is unknown in wild specimens. Since the specimens were found at a commercial shrimp farm, the authors suggested that perhaps this occurrence of hermaphroditism is in some way linked to conditions encountered during the culture of penaeid shrimps in captivity.

## SQUIDS

Cephalopods are very important, both to the marine ecosystem and to humans. They are abundant predators, some of which are large, active, and voracious. Conversely, cephalopods are important prey for many marine mammals, birds, and fishes, including economically important species. Substantial squid fisheries have existed in North America almost exclusively to provide bait for other fisheries. Cephalopods are important as food for people in many parts of the world. Furthermore, they are important in biomedical research; much of what is known about neurophysiology results from experiments with the giant axon of the squid *Loligo*.

Squid fisheries, both in U.S. waters and worldwide, concentrate on species from two families, Loliginidae and Ommastrephidae. In the United States, these fisheries currently are primarily an export industry, although utilization in the United States is increasing.

Loliginids include many species of demersal squids which attain medium to large sizes and which are both common and abundant on continental shelves. The loliginids in U.S. waters include species that are harvested commercially (the long-term potential yield from the east coast U.S. fishery has been estimated at 44,000 tons), but which are quite difficult to identify. Additionally, there are several other species of small loliginids found in U.S. waters. Generic relationships of the species are presently very confused. Four conflicting classification schemes have been proposed, based on single characters, on regional material, or on arguments that have been institutionalized in outdated literature. Because the diverse family Loliginidae is cosmopolitan, the only way to resolve relationships within it adequately is by worldwide systematic review of the taxonomic characters. Dr. Michael Vecchione, together with several colleagues, is reviewing the loliginids.

Commercially and ecologically, the most important ommastrephids in U.S. waters belong to the genus *Illex*. The potential catch of *Illex* in U.S. waters is 30,000 tons. There are four groups of *Illex* in the western Atlantic which are more or less distinct morphologically. It has been proposed that these morphotypes are separate species, although some authors still consider them to be subspecies. These arguments, based primarily upon preserved specimens, have not fully considered other components of morphological variability (e.g., geographic, seasonal, sexual, ontogenetic). Dr. Vecchione is conducting a study of *Illex* treating several components of variability from fresh as well as preserved material.

*1. Volume on Cephalopod Systematics and Biogeography.*- Together with Prof. Nancy Voss, University of Miami, and Dr. Ronald Toll, University of the South, Dr. Vecchione is editing a volume on Cephalopod Systematics and Biogeography. The multi-authored volume, which will be published in *Smithsonian Contributions to Zoology*, resulted from

a two-week international workshop conducted at George Washington University and sponsored by the Smithsonian Institution.

*2. The Gilbert L. Voss Memorial Issue.*- This memorial issue of the *Bulletin of Marine Science*, published in honor and recognition of Prof. Gilbert L. Voss (1918-1989), was edited by Dr. Vecchione together with Dr. Clyde F. E. Roper of the Smithsonian Institution. The volume is comprised of papers from two sources: (1) former students and colleagues presenting a variety of marine biological topics, and (2) a symposium on cephalopods convened in honor of Dr. Gil Voss.

*3. Multi-media data base on deepsea cephalopods.*- A multi-media package still under development uses a micro-computer to show data and images of deepsea cephalopods observed in-situ from submersibles. All collection data, e.g., geographic location, depth, etc., form the data base (from which searches can be made) and are linked with images of species from videotape or 35 mm slides. The taxon-based system can serve as a catalogue or key in the laboratory or for observers on-board submersibles or using ROV's. The system was created on an IBM-type micro-computer using dBase files and Asymetrix Toolbook software running under Microsoft Windows.

*4. Big squids.*- The capture of a very large deepsea squid, *Taningia danae* Joubin 1931, by a commercial trawl in Georges Basin, western North Atlantic, prompted a study of nomenclature and distribution of the species. This squid was provided to NSL/NMNH by the NMFS laboratory at Gloucester, Massachusetts. A permanent display of the large specimen in the Smithsonian's National Museum of Natural History is being constructed as part of a new exhibit on squids.

*5. An unusual paralarval squid.*- A squid paralarva from the eastern North Pacific is the first gonatid known to have photophores on its tentacles. Only one other gonatid species, *Gonatus pyros*, is known to have photophores, but these are located only on the eyes. *Gonatus pyros* spawns in the eastern North Pacific, and its early paralarvae are presently undescribed. Ms. Loffler and Dr. Vecchione, therefore, tested the hypothesis that this squid may be an ontogenetic stage of *G. pyros*. Tentacles of young *G. pyros* were examined histologically to see if photophore tissue might be embedded in the tentacles, however, this test yielded inconclusive results. Therefore, this very unusual specimen was described, but its identity remains undetermined.

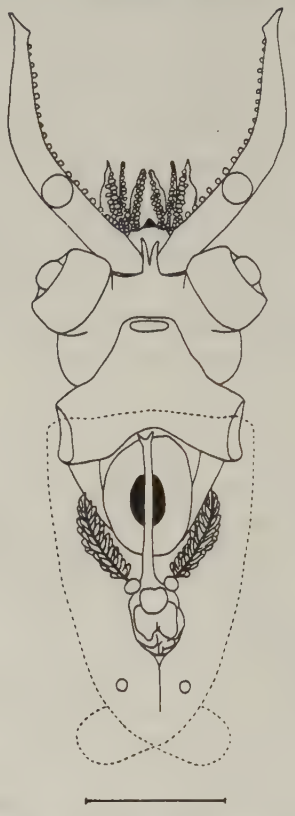

Figure 4. Ventral view of gonatid paralarva. Mantle shape estimated from inverted mantle. Scale bar = 2mm.

*6. Student research.*- Dr. Vecchione is supervising several graduate research projects on cephalopods. Elizabeth Keane's thesis at the College of William and Mary, with the aid of a museum collection of planktonic squids, is examining the heuristic value of the newly established concept of "paralarvae", which includes combined morphological and ecological criteria for determination of life-history stages. Janet Nestlerode (also at the College of William and Mary) is studying Antarctic octopods. Fulvio Zecchini of the University of Pisa, Italy, has begun thesis work at the museum on the development of the hectocotylus in *Illex*. Additionally, Kimberly Jackson, an undergraduate at Howard University and a Smithsonian Minority Intern, studied cephalopods from the NMFS groundfish surveys that are now part of the NMNH collection.

## SCIENTIFIC ILLUSTRATION

Illustrations of fishes, crabs, and cephalopods, drawn by Ms. Keiko Moore, Scientific Illustrator, appeared in three papers published by laboratory scientists in 1992. Additional figures were also drawn for three manuscripts accepted or submitted for publication. During 1992, Ms. Moore also continued work on figures (approximately 180) for a major monograph on mud shrimps prepared by Dr. Williams.

Ms. Moore's scientific illustration "*Scomberomorus plurilineatus*" (Spanish mackerel) is part of a permanent exhibit of works displayed at the Library in the Smithsonian Institution's Museum of Natural History. Featured works are those of natural history illustrators in residence at the Museum of Natural History.

Ms. Moore continued to translate scientific papers, mostly from Japanese (less often, Chinese), for Systematics Laboratory scientists, and Smithsonian scientists and librarians. Additionally, Ms. Moore serves as an interpreter and guiding official for visitors to the Systematics Laboratory and the National Museum of Natural History from Japanese museums and universities.

In January, Ms. Moore shared the techniques of ichthyological illustration with an Australian scientific illustrator from the National Museum of Natural History in Sydney, Australia.

Ms. Moore presented a two-hour lecture demonstration of the making of Japanese woodblock prints at the Federal Reserve Board of Governors in Washington, DC, as part of the celebration of Asian Pacific American Heritage Month.

Ms. Moore presented a three-hour lecture demonstration of the making of Japanese woodblock prints at the Walters Art Gallery (Asian Museum) in Baltimore, MD, in conjunction with the main exhibit of late 19th century Japanese woodblock prints. The lecture was videotaped for possible broadcast with PBS (preliminary discussions underway) and for use in printmaking courses at art schools and colleges.

Ms. Moore presented a two-hour lecture demonstration of sumi-e (Japanese brush painting) and two, one-hour workshops of the same subject at the National Museum of Women in the Arts of Washington, DC, in conjunction with the feature exhibit of paintings by Ms. Migishi, a renowned Japanese artist. The activities were organized by the Embassy of Japan.

## FIELD WORK

Dr. Austin Williams collected fossil decapod crustaceans from late Cretaceous deposits in south central Colorado during July.

## SERVICE

In addition to their research responsibilities, scientists from the Systematics Laboratory serve the scientific community and the public in other ways. The primary service functions of this Laboratory are to provide expert identifications for groups of fishes, crustaceans, and squids in which we specialize, and to furnish information on these animals. We assist visitors in the use of the national collections. We review manuscripts for scientific publications, for colleagues in NMFS, and other agencies. Finally, we assist staffs of the divisions of Fishes, Crustacea, and Mollusks of the National Museum of Natural History with curation and loans, especially material collected by NMFS.

## IDENTIFICATIONS

| ORGANIZATION | CONTACT |
|---|---|
| Copenhagen Museum, Denmark | T. Wolff |
| Coastal Fisheries Laboratory, Wakefield, R.I. | J. Karlson |
| Escuela Biología, University of Costa Rica | A. Dittel |
| Florida Museum of Natural History, Gainesville | S. Scudder |
| Gulf Coast Research Laboratory, Ocean Springs, MS | H.M. Perry |
| Inst. für. Geol. und Paläont. University of Hannover, Germany | A. Kastner |
| Inst. Technol. Pesca, Italy | P. Jareb |
| Moss Landing Laboratories, CA | S. Craig |
| Mote Marine Laboratory, FL | K. Burns |
| MWS Group, Inc. | M. Starks |
| NMFS, Milford | F. Thurberg |
| Nova University, Dania, FL | C. Messing |
| Ohio State University | E. Herndendorf |
| Science Appl. Int. Corp., RI | S. Cielinski |
| Smithsonian Institution | B. Kensley, B. Pardy, D. Smith, R. Lemaitre, L. Knapp |
| Southwest Lousiana University | R. Griffis |
| Virginia Institute of Marine Science | E. Keane |

## INFORMATION

| ORGANIZATION | CONTACT |
|---|---|
| American Fisheries Society | B. McAleer, R. Kendall |
| American International | S. Kahn |
| American Museum of Natural History, NY | M. Novacek |
| Atlantic Reference Center, St. Johns | K. Sulak |
| Audubon Magazine | A. Coulton |
| Australian Museum, Sydney | J. Lowry, D. Luedke |
| Baltimore Aquarium | C. Womack |
| Bradley University, Peoria | R. Stephens |
| Cabrio Marine Mus., San Pedro, CA | J. Bertaud |
| Caribbean Travel and Life Magazine | S. Small |
| Channel Islands Refuge | S. Jameson |
| Chesapeake Biological Laboratory | J. Luo |
| Chesapeake Research Consortium | C. McManus |
| Colorado State University | N. Curthoys |
| Dept. of Natural Resources, Puerto Rico | M. Aivera |
| Disney Adventure Magazine | C. McCafferty |
| Encyclopedia Brittanica, Chicago | L. Mahinske |
| EPA Env. Res. Lab., Duluth, Minn. | C.E. Stephan |
| Exxon | D. Johnson |
| Field Museum of Natural History, Chicago | K. Poulson, S. Randolph |
| Florida Dept. of Natural Resources | H. Grier, R. Crabtree |

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| Florida International Univ., Miami | R. von Sternberg |
| Food and Drug Administration | M. Meltzer, L. Branch, S. Causey, S. Randolph, A. Montgomery |
| Foundation for Research and Development, South Africa | G. Schirge |
| Fund. Universidade do Rio Grande, Brazil | E. Vidal |
| Fusco Seafood, NY | A. Fusco |
| George Washington University | R. Knowlton, C. Ladwig |
| Gulf Coast Research Laboratory, MS | S. Poss |
| Harbor Branch Foundation, FL | C. Young |
| Howard University | K. Jackson |
| IMD Corp., Indianapolis | S. Hiatt |
| Inst. Mar y Limnologia, Universidad National Auton. Mexico | E. Escobar-Briones, M.E. Hendrickx |
| Instituto Ciencas del Mar, Barcelona | L. Stefanescu |
| Inter-American Tropical Tuna Commission | R. Owen |
| INIDEP, (Fisheries, Argentina) | J. Diaz de Astarloa |
| INVEMAR, Universidad de Colombia, Santa Marta | A. Acero |
| Journal of Crustacean Biology | A. Humes |
| Inst. Basic Biol., Okazaki, Japan | I. Gleadall |
| Kent State University Geol. Dept., OH | A. Tucker, J. Anderson |
| Klayman and Assoc., Wash. DC | A. Fisher |
| Los Angeles County Museum | J. Gago, J. Martin |
| Marine Ecol. Lab., Los Angeles County Sanitation District | D. Cadien |
| Merriam Webster Dictionary | R.W. Pease, Jr. |
| Museo Civico Storia Natural, Verona | L. Sorbini |
| Museo Nacional de Historia Natural, Habana, Cuba | G. Silva Toboada, R. Quinones |
| Museum of Comparative Zoology, Harvard | K. Hartel |
| National Geographic Society | B. McConnell, S. Greer |
| National Fisheries Institute | R. Collette, C. Coss |
| North Carolina State University | W. Gibson |
| New Jersey Fish and Game | B. Halgren |
| New Jersey Sea Grant | N. Henderson |
| Newport News, Daily Press | M. Devincenzo |
| New York Times | C. Yoon |
| New York State Hudson Research Laboratory | L. Abele |
| NMFS Annapolis and NOAA Off. Est. Mar. Living Res. | D. Fields |
| NMFS, Beaufort | J. Smith |
| NMFS, Charleston | A. Jennings |
| NMFS, Gloucester | C. Martin, D. Mason, C. Matthews |
| NMFS, Honolulu | D. Hawn, B. Mundy |
| NMFS, Kodiak, AL | R. McIntosh |
| NMFS, Milford | R. Robohm |
| NMFS, Narragansett | A. Blott, D. Miller |
| NMFS Office of Trade and Industry | K. Young |
| NMFS Office of Scientific Publications | J. Geiger |
| NMFS, Oxford | F. Kern, R. Khan, A. Rosenfield |
| NMFS, Pascagoula | M. Grace, P. Gross, B. Rohr |
| NMFS, Sandy Hook | M. Fahay, C. MacKenzie |
| NMFS, Silver Spring | K. Hollingshead |

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| NMFS, Woods Hole | L. Forbes, W. Michael |
| NMFS/NOAA | D. Weidner |
| NOAA, Estuarine and Living Marine Resources | S. Jury |
| NOAA/NOS, Rockville | D. Nelson |
| NOAA Office of Civil Rights | R. Reichardt |
| NOAA Office of Chief Scientist | D. Cottingham |
| NOAA Office of Ecology and Conservation | D. Wieting |
| NOAA Office of General Council Fish. | R. Allison |
| NOAA, NOS, Strategic Environmental Assessments | S. Stone |
| Nova University, FL | C. Messing |
| NURC/UCAP | P. Auster |
| NWS Group, Inc. | M. Starks |
| Oceanographic Inst., Honolulu | W. Hougart |
| Ohio State University | C. Cole |
| Osprey Books | I. Dore |
| Otago University, New Zealand | E. Harvey |
| Pacific Identifications | S. Crockford |
| Pacific Science Association | L.G. Eldridge |
| Perm State Univ., Perm, Russia | S. Mandrytza |
| Project Oceanology, Avery Point | J. Thompson, M. Weiss |
| Private citizens | F. Bavendam, S. Crockford, A. Edgcomb, A. Falik, N. Fraley, H. Gaffin, R. Hudson, A. LeRouge, A. Lichtenstein, S. Reilly, G. Small, D. Whynot |
| Quest Reef Foundation, Big Pine Key, FL | L. Kennedy, J. Thomas, L. Watling |
| Royal Ontario Museum, Toronto | R. Winterbottom |
| Institute of Oceanology, Russian Academy of Sciences, Moscow | N. Parin |
| Rutgers University | N. Psuty |
| San Diego Natural History Society | R. Brusca |
| Santa Barbara Museum | F. Hochberg |
| Sara Scientific, Pleasant Hill, CA | S. Fishman |
| Scholastic Productions | N. Kaigan |
| Scripps Institute of Oceanography, La Jolla | R. Hessler |
| Seafood Dealer, San Francisco | T. Elliott |
| Smithsonian Institution | F. Talbot, L. Knapp, R. Lemaitre |
| State University of New York, Stony Brook | E. Schultz |
| Times Picayune Newspaper | S. Casamir, S. Causey, T. Chan |
| Tulane University, New Orleans | H. Bart |
| Tulear University, Madagascar | M. Dina, K. Drake |
| University of Arizona, Tucson | G. Bharathan |
| University of Central Florida | F. Snelson |
| University of Costa Rica | A. Dittel |
| University of Delaware | T. Targett, D. Martin |
| Universidade de Habana, Cuba | G. Alayon Garcia |
| University of Hawaii | D. Greenfield |
| University of Maine | H. DeWitt |
| University of Maine, Darling Marine Center | R. Steneck |
| University of Massachusetts | A. Abend, R. Gee |
| University of Miami | N. Voss |
| University of Mississippi | G. Gaston |
| Universidad Nacional Santa Marta, Colombia | N. Hernando Campos |

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| University of New Brunswick, Canada | F. Marques |
| University of New England | D. Koester |
| University of New Hampshire | M. Armstrong |
| University of North Carolina, Institute of Marine Sciences | E. Duffy |
| University of Pisa, Italy | F. Zecchini |
| University of Richmond | W. Woolcott |
| University of Rhode Island | W. Macy |
| University of the South | R. Toll |
| University of South Florida, Department of Geology | H. Harrison |
| University of Southwestern Louisana | R. Dauer |
| University of Texas Marine Biomedical Institute | R. Hanlon |
| US Customs, NY | T. Brady |
| US Department of Agriculture, Nutrition | R. Dengrove |
| US Geological Survey, Reston | E. Robinson, D. Rowe |
| VERSAR, Inc., Springfield, VA | S. Duda |
| Virginia Institute of Marine Science | H. Banford |
| Western Australian Museum | G. Allen |
| Woods Hole Oceanographic Institution | G. Harbison, P. Wiebe |
| World Bank | K. McKiton, J. Pearce |
| Yokohama National University, Japan | T. Kikuchi |

## MANUSCRIPTS REVIEWED

Reviews of 26 manuscripts were provided for:

Bulletin of Marine Science
Bulletin Tokai Reg. Fish. Res. Lab.
Canadian Journal of Fisheries and Aquatic Sciences
Canadian Journal of Zoology
Copeia
Estuaries
Fishery Bulletin, U.S.
Journal of Crustacean Biology
Journal of Northwest Atlantic Fisheries Science
Maine Naturalist
Marine Biodiversity Strategy
Memoirs of the National Museum of Victoria
Proceedings of the Biological Society of Washington
Ranger Rick
Researches on Crustacea
Transactions of the American Fisheries Society

60 manuscripts were also reviewed for authors at their request.

## RESEARCH PROPOSALS REVIEWED

20 proposals were reviewed for the following organizations:

American Fisheries Society, Alaska Chapter
Department of Commerce, Pioneer Fund Program
Hawaii Sea Grant
Hawaii Undersea Research Laboratory
Man and the Biosphere
McArthur Foundation
National Geographic Society
National Science and Engineering Council of Canada
National Science Foundation's Programs in Systematic Biology and Ecological Studies
NOAA-NURC, Wilmington, NC
Smithsonian Institution Postdoctoral, Predoctoral, and Short-Term Visiting Scientist Fellowship Programs

## AMERICAN ASSOCIATION FOR ZOOLOGICAL NOMENCLATURE

Dr. Williams served as past president during 1992. Dr. Vecchione served as councilor and participated in the annual meeting.

## AMERICAN FISHERIES SOCIETY

Dr. Williams served as a member of the American Fisheries Society Committee on Names of Aquatic Invertebrates.

## AMERICAN LITTORAL SOCIETY

Dr. Collette continued to serve on the scientific advisory council.

## AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS

Drs. Collette, Munroe, and Rajaguru attended the annual meeting held at the University of Illinois, Champaign, in June. Drs. Collette and Munroe participated in the Board of Governors and Business meetings. Dr. Collette presented a paper describing a new genus and species of freshwater halfbeak from Sulawesi in the East Indies. He was co-author of a paper on the classification of tunas, mackerels, and their relatives, which proved to be highly controversial. Dr. Rajaguru presented a paper on new species of cynoglossid flatfishes from Indian waters, and with a student from Roosevelt High School in Hyattsville, Maryland, co-authored a poster describing anomalies of flatfishes occurring in Indian waters.

## BIODIVERSITY MEETING

During July 1991, Dr. Vecchione represented NOAA at a Keystone colloquium on biodiversity to discuss, critique, and contribute to a global biodiversity strategy. This has resulted in a joint publication by the World Resources Institute (WRI), the World Conservation Union (IUCN), and United Nations Environment Program (UNEP).

## BIOLOGICAL SOCIETY OF WASHINGTON

Dr. Williams served as a member of the Council and continued as Custodian of Publications.

Dr. Collette participated in meetings as a member of the Council.

Dr. Munroe became the Assistant Editor for Vertebrate Zoology in June, 1992.

Dr. Vecchione participated in annual and executive council meetings and then stepped down as Treasurer of the Society.

## CEPHALOPOD INTERNATIONAL ADVISORY COUNCIL

Dr. Vecchione continued to serve as an elected member of the council.

## CRUSTACEAN SOCIETY

Dr. Williams presented a paper on the systematics of stone crab at the meeting of the Society in Charleston, South Carolina. Dr. Williams also served as a member of the Nomenclature Committee.

## CYBIUM

Dr. Collette continued as a member of the Editorial Board.

## FISHES OF THE WESTERN NORTH ATLANTIC

Dr. Collette continued to serve as Chairman of the Editorial Board.

## INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA (ICES)

Dr. Vecchione served as a member of the newly reconstituted Working Group on Squid Biology.

### SMITHSONIAN INSTITUTION

Drs. Collette and Munroe served as Research Associates in the Department of Vertebrate Zoology, Drs. Canet, Williams, and Vecchione in the Department of Invertebrate Zoology.

Dr. Collette served as advisor for a Smithsonian Summer Intern, Amy Downing. Dr. Vecchione served as co-advisor with Dr. Clyde Roper of the Smithsonian for Minority Intern, Kimberly Jackson of Howard University.

Dr. Williams served as chairman of the Smithsonian Oceanographic Sorting Center Arthropod Advisory Committee until dissolution of the Sorting Center in May, and as Editor for manuscripts submitted to *Smithsonian Contributions to Zoology* for the Department of Invertebrate Zoology.

Ms. Moore presented a three-hour lecture and demonstration on the making of Japanese woodblock prints as part of the The Celebration of Asian Pacific Heritage Month at the National Museum of Natural History.

Ms. Moore taught three eight-week courses (in winter and fall semesters) in Sumi-e (Japanese brush painting) at the Smithsonian's Resident Associate Programs' extension school at Maryland College of Arts and Design in Silver Spring, Maryland.

Ms. Moore presented a slide-lecture and demonstration of the making of Japanese woodblock prints in December at the Japanese Embassy's "Cultural Salon" where Madam Kuriyama, the Japanese Ambassador's wife, presents various Japanese arts-and-crafts and music to American educators, museum directors, and congressional persons.

Ms. Moore continued to serve as a Program Assistant Coordinator of Smithsonian's Asian Pacific American Heritage Committee which organizes the annual Asian Pacific American Heritage month-long celebration.

### SYSTEMATICS AGENDA 2000

Drs. Collette and Vecchione served as co-chairs and Dr. Williams served as a member of the Fisheries Committee of Systematics Agenda 2000: Integrating Biological Diversity and Societal Needs. They drafted a report on the importance of systematics to fisheries.

### TUNA CONFERENCE

Dr. Collette attended the 43rd Annual Tuna Conference at Lake Arrowhead, CA, and presented a paper on the classification of tunas, mackerels, and other scombroid fishes.

### OTHER MEETINGS ATTENDED

American Association of Zoological Nomenclature
American Fisheries Society, Annual Meeting of Committee on Common Names of Aquatic Invertebrates
Association of Systematic Collections
Atlantic Large Pelagics Constituency Meeting, 1992
Bermuda Biological Station
Crustacean Society
National Museum of Natural History, J. L. Barnard Memorial Symposium
National Museum of Natural History and National Zoo, Cuban-U.S. Roundtable on Biodiversity
NOAA Awards Ceremony
NOAA/USFWS Introduced Species
Society for Experimental Biology
Smithsonian Institution Biodiversity Meeting
World Wildlife Fund

## UNIVERSITY AFFAIRS AND TEACHING

### BERMUDA BIOLOGICAL STATION

Dr. Collette taught a four-week course, "Biology of Fishes", to a class of 12 students at the Bermuda Biological Station.

### BOSTON UNIVERSITY MARINE PROGRAM (BUMP)

Dr. Collette taught his "Biology of Fishes" course a second time, to a class of 20 undergraduates in the Boston University Marine Program. The first half of the course was taught at the Marine Biological Laboratory in Woods Hole and then the whole class flew to Barbados for the second half of the class at the Bellairs Laboratory.

## ELEANOR ROOSEVELT HIGH SCHOOL, HYATTSVILLE, MARYLAND

Dr. Munroe served as advisor on two high school students science projects examining systematic problems of cynoglossine tonguefishes and achirid soles.

## GEORGETOWN UNIVERSITY

Dr. Collette delivered a lecture on the diversity of fishes at the Georgetown Family Center.

## MONTGOMERY COUNTY, MARYLAND, DEPARTMENT OF EDUCATION

Ms. Moore designed the cover for the Japanese language textbooks for the Montgomery County public school's foreign language programs. Numerous other requests for copies of the textbooks from similar programs in other states have been received.

## POTOMAC ELEMENTARY SCHOOL, DAHLGREN, VIRGINIA

Dr. Vecchione delivered a talk on submersibles to the fifth grade class.

## TIVERTON MIDDLE SCHOOL, TIVERTON, RHODE ISLAND

Dr. Munroe delivered a slide lecture on diversity of fishes inhabiting Narragansett Bay, Rhode Island, to the fifth grade class.

## VIRGINIA INSTITUTE OF MARINE SCIENCE/ COLLEGE OF WILLIAM AND MARY

Dr. Collette was appointed a member of the Associate Faculty and participated in committee meetings for Heidi Banford on her thesis project on halfbeak systematics and for Dan Scoles on his dissertation project comparing genetic variation in yellowfin tuna and chub mackerel. Dr. Collette was the dedication speaker for Nunnally Hall, a new facility that will house the VIMS marine vertebrate ecology program and the VIMS fish collection.

Dr. Munroe served as a member of the Associate Faculty and served on the Ph. D. dissertation committee of Rogerio Texeira on reproduction and feeding strategies of several species of western Atlantic pipefishes (*Syngnathus*: Syngnathidae).

Dr. Vecchione served as a member of the Associate Faculty and served as thesis advisor for two Master's degree students working on cephalopods.

## WAKEFIELD HIGH SCHOOL, ALEXANDRIA, VIRGINIA

Dr. Williams served as a judge for zoological entrants in the District Science Fair, Wakefield High School, Alexandria, Virginia.

## WASHINGTON, D.C.

Ms. Moore participated (with two art works) in the Asian-American Pacific Art Exhibition, "Images '92: Circle of Friendship" at the Charles Sumner Museum and Archives from September 1992 to January 1993. The exhibition was sponsored by the Asian American Arts and Media and the Sumner Museum, and was funded by the D.C. Commission on Arts and Humanities, the D.C. Community Humanities Council, Eugene and Agnes E. Meyer Foundation, and the Washington Post.

As part of a two-month study on Japan, Ms. Moore presented a lecture and demonstration of various Japanese arts and crafts and conversational Japanese including some customs to 15 second grade students at the Capitol Hill Day School in April.

## WASHINGTON, D.C. AND MARYLAND PUBLIC SCHOOLS

Ms. Moore again presented an informal talk and demonstrated scientific illustration techniques to eighth and ninth grade students from Washington, D.C., and nearby Maryland schools who were participants in the "1000 Civil Rights Group" of the I Have A Dream Foundation's program for disadvantaged young people. This experience was to provide students with an introduction to careers in science and to enhance basic skills and self esteem.

# NATIONAL SYSTEMATICS LABORATORY PUBLICATIONS, 1992


Anderson, W.D., Jr., P.J. Kailola, and B.B. COLLETTE. 1992. Two new snappers (Teleostei: Lutjanidae: Apsilinae): *Paracaesio paragrapsimodon* Anderson and Kailola from the western Pacific and *P. waltervadi* Anderson and Collette from the western Indian Ocean. Proc. Biol. Soc. Wash. 105(3):443-461.

COLLETTE, B.B. 1992. (Book Review). Fishes of the Southern Ocean. O. Gon and P.C. Heemstra (eds.). BIOMASS Newsletter 13(2):17.

_____ and G.B. Gillis. 1992. Morphology, systematics, and biology of the double-lined mackerels (*Grammatorcynus*, Scombridae). Fish. Bull., U.S. 90(1):13-53.

_____, N.V. Parin, and M.S. NIZINSKI. 1992. Catalog of type-specimens of recent fishes in the National Museum of Natural History, Smithsonian Institution. 3. Beloniformes (Teleostei). Smithsonian Contrib. Zool. No. 525, 16 pp.

Hanlon, R.T., S.v. Boletzky, T. Okutani, G. Pérez-Gandaras, P. Sanchez, C. Sousa-Reis, and M. VECCHIONE. 1992. Myopsida Orbigny, 1845. In: "Larval" and Juvenile Cephalopods. A Manual for Their Identification. M. J. Sweeney et al. (eds.). Smithson. Contrib. Zool. No. 513:37-54.

MUNROE, T.A. 1992. Interdigitation pattern of dorsal-fin pterygiophores and neural spines, an important diagnostic character for symphurine tonguefishes (*Symphurus*: Cynoglossidae: Pleuronectiformes). Bull. Mar. Sci. 50(3):357-403.

PÉREZ FARFANTE, I. and L. Robertson. 1992. Hermaphroditism in the penaeid shrimp *Penaeus vannamei* (Crustacea: Decapoda: Penaeidae). Aquaculture 103: 367-376.

RAJAGURU, A. 1992. Biology of two co-occurring tonguefishes, *Cynoglossus arel* and *C. lida* (Pleuronectiformes: Cynoglossidae) from Indian waters. Fish. Bull., U.S. 90(2):328-367.

_____ and G. Shantha. 1992. The sessile barnacle, *Xenobalanus globicipitis* (Coronulidae) from the bottlenose dolphin, *Tursiops truncatus* (Delphinidae), with a summary of previous records from cetaceans. Fish. Bull., U.S. 90(1):197-202.

Robbins, T.W., B.B. COLLETTE, and C.R. Robins. 1992. Obituary: Edward C. Raney 1909-84. Copeia 1992(4):1143-1150.

Roper, C.F.E., M. VECCHIONE, and M.J. Sweeney. 1991. The Gilbert L. Voss Memorial Issue. Foreword. Bull. Mar. Sci. 49(1-2):3-4

Van Dover, C.L. and A.B. WILLIAMS. 1991. Egg size in squat lobsters (Galatheoidea): constraint and freedom. pp. 143-156. In: Crustacean Egg Production. A. Wenner and A. Kuris (eds.). Crustacean Issues, Vol. 7. Balkema, Rotterdam.

VECCHIONE, M. 1991. Long-term trends in the abundance of the copepod *Acartia tonsa* in the Calcasieu Estuary. Contr. Mar. Sci. 32:89-102.

_____. 1991. A method for examining the structure and contents of the digestive tract in paralarval squids. Bull. Mar. Sci. 49(1-2):300-308.

_____ and C.F.E. Roper. 1992. Cephalopods observed from submersibles in the western North Atlantic. Bull. Mar. Sci. 49(1-2):433-445.

_____ and C.F.E. Roper. 1992. *Taningia danae* Joubin, 1931 (Mollusca, Cephalopoda): proposed precedence over *Taningia persica* (Naef, 1923). Bull. Zool. Nomencl. 49(4):261-263.

_____, B.H. Robison, and C.F.E. Roper. 1992. A tale of two species: tail morphology in paralarval *Chiroteuthis* (Cephalopoda: Chiroteuthidae). Proc. Biol. Soc. Wash. 105(4):683-692.

WILLIAMS, A.B. 1992. (Book Review). H.J. Squires. 1990. Decapod Crustacea of the Atlantic Coast of Canada. Can. Bull. Fish. Aquat. Sci. 221: 1-532. J. Crust. Biol. 12:329.

_____ and R. Wahle. 1992. Distinguishing juvenile stages of Jonah and Atlantic rock crabs, *Cancer borealis* and *C. irroratus* (Crustacea: Decapoda: Cancridae). J. Crust. Biol. 12:464-466.

WRI, IUCN, and UNEP. 1992. Global Biodiversity Strategy. Guidelines for Action to Save, Study, and Use Earth's Biotic Wealth Sustainably and Equitably. WRI, IUCN, and UNEP. 244 pp.

Young, R.E., K.M. Mangold, and M. VECCHIONE. 1992. The enoploteuthid group of families. In: "Larval" and Juvenile Cephalopods. A Manual for Their Identification. M. J. Sweeney et al. (eds.). Smithson. Contrib. Zool. 513:55-66.

## PAPERS IN PRESS

Banford, H.M. and B.B. COLLETTE. A new species of halfbeak (Teleostei: Hemiramphidae) from the Atlantic and Gulf coasts of the United States. Proc. Biol. Soc. Wash.

COLLETTE, B.B. Families Batrachoididae, Belonidae, Coryphaenidae, Hemirhamphidae, Scombridae, and Xiphiidae. FAO Species Identification Sheets, East Central Pacific.

_____ and N.V. Parin. Flyingfishes and allies. In: Encyclopedia of Animals: Fishes. J.R. Paxton (ed.). Weldon Owen Publ., Sydney.

Hostetter, E.B. and T.A. MUNROE. Age, growth, and reproduction of tautog, *Tautoga onitis* (Linnaeus), (Labridae, Perciformes) from coastal waters of Virginia. Fish. Bull., U.S.

Parin, N.V. and B.B. COLLETTE. Results of the research cruises of the FRV "Walther Herwig" to South America. LXIX. A new species of cutlassfish (Scombroidei: Trichiuridae: *Lepidopus*) from the western Atlantic Ocean. Arch. FischWiss.

Roper, C.F.E. and M. VECCHIONE. A geographic and taxonomic review of *Taningia danae* Joubin, 1931 (Cephalopoda: Octopoteuthidae), with new records and observations on bioluminescence. Bull. Tokai Reg. Fish. Res. Lab.

Sweeney, M.J. and M. VECCHIONE. Generic and specific names introduced in the family Loliginidae. In: Systematics and Biogeography of Cephalopods. N.A. Voss, M. Vecchione and R. Toll (eds.). Smithsonian Contrib. Zool.

VECCHIONE, M. Ontogenetic characters and cephalopod systematics. In: Systematics and Biogeography of Cephalopods. N.A. Voss, M. Vecchione and R. Toll (eds.). Smithsonian Contrib. Zool.

_____, T.F. Brakoniecki, Y. Natsukari, and R.T. Hanlon. A provisional generic classification of the Loliginidae. In: Systematics and Biogeography of Cephalopods. N. A. Voss, M. Vecchione and R. Toll (eds.). Smithsonian Contrib. Zool.

_____, C.F.E. Roper, C.C. Lu, and M.J. Sweeney. Development, distribution, and relative abundance of paralarval cephalopods in the western North Atlantic. Smithsonian Contrib. Zool.

WILLIAMS, A.B. Reflections on crab research in North America since 1758. Crustacean Issues. A. A. Balkema/Rotterdam.

## COMPLETED MANUSCRIPTS

Carpenter, K.E., B.B. COLLETTE, and J.L. Russo. Unstable and stable classifications of scombroid fishes. For: Bull. Mar. Sci.

COLLETTE, B.B. (ed.). National Systematics Laboratory 50 year bibliography (1942-1992). For: NOAA Tech. Memo. NMFS-F/NEC.

LOFFLER, D. and M. VECCHIONE. An unusual squid paralarva (Cephalopoda cf. Gonatidae) with tentacular photophores. For: Proc. Biol. Soc. Wash.

Poss, S.G. and B.B. COLLETTE. Second survey of fish collections in the United States and Canada. For: Copeia.

VECCHIONE, M. Systematics, ecology, and the physiological adaptations of cephalopods. For: Mar. Behav. Physiol.

WILLIAMS, A.B. Mud shrimps, Upogebiidae, from the western Atlantic (Crustacea: Decapoda: Thalassinidea). For: Smithsonian Contrib. Zool.

_____. Comments on *Gebia major capensis* Krauss, 1843 (currently *Upogebia capensis*; Crustacea, Decapoda): proposed replacement of neotype, so conserving the usage of *capensis* and also that of *G. africana* Ortmann, 1894 (currently *Upogebia africana*). Case 2827. For: Bull. Zool. Nomencl.

Felder, D.L., A.B. WILLIAMS, and J.E. Neigel. Congruence of phenotypic and genetic analyses for stone crabs, *Menippe mercenaria* (Say) from Georgia, USA (Decapoda, Xanthidae). For: J. Crust. Biol.

## STAFF

| | |
|---|---|
| Bruce B. Collette | Laboratory Director and Ichthyologist |
| Isabel C. Canet (Pérez Farfante) | Carcinologist Emeritus |
| Thomas A. Munroe | Ichthyologist |
| Michael Vecchione | Squid Biologist |
| Austin B. Williams | Carcinologist |
| Grace Klein-MacPhee | Fishery Biologist |
| Keiko H. Moore | Scientific Illustrator |
| Virginia R. Thomas | Secretary |
| Martha Nizinski | Zoologist |
| Ruth Gibbons | Museum Specialist |
| Deborah Rothwell | Museum Specialist |
| Kon Rhyu | Museum Specialist (resigned, August) |
| Maureen Aninye | Biological Aide (Temporary) |
| Alsane Soumah | Museum Aide (Temporary) |
| Elizabeth Keane | Biological Lab. Technician (Temporary) |
| Janet Nestlerode | Museum Specialist (Temporary) |
| Christopher Aadland | Museum Specialist (Temporary) |
| A. Rajaguru | Visiting Investigator |
| David Stein | Visiting Investigator |